



Quick Help 12: Adding Spatial Data to a Sampling Unit

Objective: Project Leaders with data in the Avian Knowledge Network data management system (AKN) will learn how to input spatial data for units associated with their project.

Audience: Current, registered users with *Project Leader* access to a project in the AKN.

1 Conventions:

Users must have Project Leader access for a project in the AKN in order to create and manage sampling units for that project, including digitizing or uploading spatial data. Contact the current Project Leader for your project to obtain access, or for new projects, contact your regional data manager for guidance.

There are two main options for inputting spatial data: digitally drawing the spatial unit directly onto a Google map within the AKN database, or uploading GIS files. GIS files can be uploaded either as a KML/KMZ file, GPS-U file, Waypoint Plus file, or ArcGIS Shapefile (SHP). Files must follow the World Geodetic System 1984 (WGS84) datum. Files projected in Web Mercator or other projections, even if using a WGS84 coordinate system, cannot be accepted. If uploading a shapefile, the file must be uploaded as a zip file containing all SHP/SHX/DBF files.

2 Log in to the Project Leader Application

Log in to the Project Leader Application by going to <https://data.prbo.org/apps/projectleaders/>. Under the Sampling Units heading, select the **Create and Manage** link. You can also access this link anywhere in the Project Leader application by hovering your cursor over the **Sampling Units** tab at the top of the page and selecting the **Create and Manage** link. Select the project that you are interested in and click **enter**.

3 Input Spatial Data

Project Leaders can input spatial data when (1) first creating a sampling unit or (2) at a later time after the unit's creation.

Before adding or editing any spatial data to a sampling unit, you must first select the study area of the sampling unit you wish to create or the sampling unit you wish to add spatial data to. For example, if you are interested in adding or updating spatial information for a management unit (area), you will select the study area that the management unit is nested within. To update spatial information for a point, you will select and highlight the transect that the point is a part of.



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For option 1, available actions are listed under the section titled, 'Add Sampling Units under the highlighted feature.'

1. **Online form** – This option will allow you to create a new unit and digitize its spatial boundary using the user interface. This involves drawing the sampling unit's location on top of a Google map.
2. **GPS-U file, Waypoint Plus file, KML file, SHP file** – These options will allow you to create a new unit and upload spatial information. Select the button corresponding to the file type you are wanting to upload.

For option 2, available actions to upload spatial data are listed under the section titled, 'Update Sampling Unit geometry under the highlighted feature.'

3. **GPS-U file, Waypoint Plus file, KML file, SHP file** – These options will allow you to upload spatial information to an existing unit or units. Select the button corresponding to the file type you are wanting to upload.

For option 2, to upload or edit the spatial data by digitizing it, select **edit** under the section titled 'Manage the highlighted feature:'. Note that, unlike the previous options, you will select the unit itself. For example, if you want to digitize a spatial boundary for an existing point you will select that point, not the transect.

Project Leader

Home | **Sampling Units** | Field Observations | Project Definition

Create and Manage Sampling Units

Select the transect, 'BackTrail (BACKTRAIL)', to update spatial data for BT01, or add a new point.

Digitize a new unit

Digitize existing unit

Add Sampling Units under the highlighted feature with:

- online form
- GPS-U file
- Waypoint Plus file
- KML file
- SHP file

Create new unit

Update Sampling Unit geometry under the highlighted feature using:

- GPS-U file
- Waypoint Plus file
- KML file
- SHP file

Update existing unit

Manage the highlighted feature:

- edit
- move in hierarchy
- delete



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NOTE: When uploading spatial data as a SHP file you will be prompted to choose field from your shapefile's attribute table to be used as the **Long Name** and **Short Name** of the sampling unit.

The **Long Name** is what you commonly refer to the sampling unit as.

The **Short Name** is how your sampling unit will be identified in tables, maps, charts, and other places where less a less verbose name is appropriate, and must be less than 13 characters. Short names tend to be abbreviations or acronyms of the long name so that it is still identifiable as the particular sampling unit. It is also commonly a unique number.

Because you will be prompted to choose these names from fields in the attribute table of your shapefile, it is good practice to have the appropriate long and short name fields already present in your shapefile's attribute table upon upload into the AKN. If you are unsure how to add fields to your shapefile's attribute table, refer to the **Appendix: Shapefiles (SHP)** for guidance.

Another thing to note is that when uploading the spatial data for multiple points or polygons at a time, you are able to have the same long name for each point. However, the AKN requires a unique short name. If your points have the same long name and short name upon upload the AKN will automatically add identifying numbers to these points. For example, if all of your points have a long name of White Pond and short name of WP, the AKN will upload the points as follows:

1. **Long Name:** White Pond **Short Name:** WP
2. **Long Name:** White Pond[2] **Short Name:** WP002
3. **Long Name:** White Pond[3] **Short Name:** WP003....

3.1 Digitizing sampling unit boundaries

Follow the guidance above to select and highlight the correct unit, then select either **online form** if digitizing spatial data for a new unit, or **edit** if digitizing spatial data for an existing unit. If attempting to digitize spatial data for a new unit you will need to provide additional information to set up that unit, such as the unit name. For more information on creating a new unit, refer to the [AKN User Guidance Manual](#) in ServCat.



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Confirm that the type of sampling unit to be digitized (e.g., Point Count Point) is selected and click **enter**. For new units, click on the check-box to select the type of unit. Be sure that you are adding/updating spatial data for the correct unit. Scroll down to the bottom of the form and click on the orange box, labeled with the type of unit (e.g., point). The text next to the orange box will read either 'Digitize location' or 'Geometry' depending on if it is an existing or new unit (see image below). If existing spatial data was already input for a given unit, coordinates will be displayed in the box. Click **clear** to remove any existing spatial data and click on the orange box to re-digitize.

Edit a Sampling Unit

*Select your project **DUMBIO - Test Project for trying out Biologists 2**
As part of **BackTrail(BACKTRAIL)**

Edit

*Type(s) of sampling unit **Point Count Point (Point)**

*Create a name for this sampling unit

*Give this sampling unit a short name

Description

URL with Information

Landowner Category

Is location discoverable? ☒ yes ☐ no

Is location active for new observations? ☒ yes ☐ no

Geometry:

If existing spatial data exists for the unit, you will see coordinates here. Select 'clear' to remove existing data, then click the orange box to re-digitize



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From here you will be taken to the digitizing widget in Google where you will zoom into your Project area and digitize your unit or study area. Left click around the boundary of your unit to assign vertices. Once complete, double click to finish editing, and click **keep it** to save edits. From here, you will be taken to the previous page where you will click **update** to save the spatial data for that unit in the database.



3.2 Uploading boundaries via files

Follow the guidance above to select and highlight the correct unit, and to choose the appropriate file type under the correct section. Confirm that you are adding spatial information for the correct project and unit. Click **Choose File** to browse to the local file and attach it to the form. Make sure the file or folder you are trying to upload is in the correct format (e.g., zip file if uploading shp data). For new units you will need to select the type of unit and provide a prefix and suffix for 'long name', the name of the unit(s) to be created. Once all information is filled out and you have provided the correct spatial file(s), click **next**.



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For shapefiles you will be asked to select the column(s) from the file(s) you just uploaded that you want to serve as the identifier for the feature or features to be uploaded. Next you will select one or more units from the file(s) you just uploaded and click **select** to bring it over. Then click **process**.

Integrated Waterbird Management & Monitoring

Site (Project): IWMTEST

Project Leader

Home | Sampling Units | Field Observations | Load Observations in Bulk | Project Definition

Add KML/KMZ Site Locations

pointblue-org.mail.protection.outlook.com
pointblue-org.mail.protection.outlook.com
datasolutions@pointblue.org
cadc_webmaster@prbo.org
DEJU Application Error in projectleaders

You are logged in as tim_jones@fws.gov
Log out
Give Us Your Feedback
Preferences

Select your project **IWMTEST - Test project for IWM Beta testers**
As part of **New Unit(CA-001-AZ)**
*Type(s) of sampling unit **IWM Management Unit (Area)**
Add

Select one or more KML/KMZ file entries, and click Select. Repeat for as many KML/KMZ file entries as you want. Click Clear All to start over.
When finished, click Process to save everything to the database.

1. Select KML/KMZ entries to add and click Select.
Use Shift or Ctrl click for selecting multiple entries.

2. Repeat. When finished, click Process to process list below.

SACRAMENTO NATIONAL WILDLIFE REFUGE (CA-001-A) [polygon] **select** >>

process **clear all**
Nothing to process.

When finished, confirm that your unit(s) uploaded correctly by downloading and viewing them. Repeat this process for any additional units.

Project Leader

Home | **Sampling Units** | Field Observations | Project Definition

Download
Create and Manage

Sampling Units - Download

IWMTEST - Test project for IWM Beta testers **open new project**

Selecting Sampling Units: Check all of the Sampling Units you want to select by clicking on each one. Open any part of the tree to get to more Sampling Units. To uncheck a Sampling Unit, click on it again. If you check or uncheck a Sampling Unit that contains other Sampling Units, the entire set of Sampling Units will be checked or unchecked. Click **Select All** to select and **Clear All** to unselect everything in the tree.

1. Select sampling units from the tree below.

select all **clear all**

- ☒ IWMTEST - Test project for IWM Beta testers
 - ☐ east unit (EU-002)
 - ☐ Harrisleeck (HV-1)
 - ☐ SACRAMENTO NATIONAL WILDLIFE REFUGE (SACHWR)
 - ☐ West Unit (WU-002)

2. Download selected Sampling Units as:

All coordinate data uses the WGS-84 datum.

- Sampling Units and center points (LatLong):**
 - Text file** **CSV (Excel) file**
- GPS locations (UTM):**
 - GPS-U file** **Waypoint file**
- GIS data:**
 - ESRI Shape file** **Google Earth file**
- Measurements (areas only):**
 - Text file** **CSV (Excel) file**
 - HTML**
- Sampling Unit hierarchy for entire project:**
 - Text file** **HTML**

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4 Appendix: Shapefiles (SHP)

This appendix addresses common errors when uploading/editing SHP spatial data into the AKN, solutions to those errors, and information on how to save shapefiles from ArcMap and prepare the file for upload into the AKN.

4.1 Common Error 1:

You must first project the SHP file into Lat/Long WGS-84 before this application can use your data.

a. Troubleshooting:

Your shapefile is likely not projected correctly in WGS-84. To troubleshoot this issue:

1. Open the shapefile in ArcMap. Right click the layer and select properties.
 - a. Under the **Source** tab in the *Data Source* section **GCS_WGS_1984** should be listed for Geographic Coordinate System and **D_WGS_1984** should be listed for Datum. There should be no information on the projection.
 - i. If a projected coordinate system is listed, even if it is WGS_1984_World_Mercator, this is likely your issue.
 - b. Another way to check this is to go to where your shape file was saved in the file explorer and open the .prj file in any text reader, like notepad or WordPad.
 - i. It should read:

```
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984"...
```
 - ii. There should be NO PROJECTION listed. The following is INCORRECT and will result in an error if attempted to be uploaded to the AKN:

```
PROJCS["WGS_1984_World_Mercator",GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984"...
```
2. Overlay the shapefile onto a base map in ArcMap to make sure the points or polygons in the shapefile are where you expect.

b. Solution:

1. The file can be re-projected with the correct coordinate system by first opening the shapefile in ArcMap.
2. Under the **Geoprocessing** tab select *ArcToolbox*.
 - a. Expand the *Data Management Tools* tab, then the *Projections and Transformations* tab. Select the **Project** tool.



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3. For *Input Dataset or Feature Class*, select the data you wish to re-project from the drop down menu.
4. For *Output Dataset or Feature Class* browse to the location where you want to save your newly projected file and name it appropriately. It is ok that if there is not an option to be saved as a shapefile at this time. Refer to **Saving your newly projected/transformed data** below.
5. For *Output Coordinate System*, click the button to the right of the input box, which resembles a hand pointing to something on a sheet of paper.
 - a. Expand *Geographic Coordinate Systems*.
 - i. Expand *World*.
 - ii. Select **WGS 1984** and click *OK*.
6. Click *OK*.
 - a. Your newly projected file should automatically appear under the layers tab.
 - b. Overlay a base map to check if projection is where you expect.

4.2 Common Error 2:

No geometry (points, lines, polygons) found in file.

a. Troubleshooting:

Something about or in your file is disrupting the ability of the database to upload it. Common issues which result in this error include:

1. There may be missing files in the .zip file being uploaded. Check that all of the appropriate .cpg, .dbf, .prj, .sbn, .sbx, .shp, .shp.xml, and .shx files are included.
 - a. Check the original location the shapefile was saved and try re-compressing the file for upload.
2. There may be an additional file or folder in the .zip folder attempting to be uploaded.
 - a. Extract all of the files from the zip file which was an upload was attempted. Only the aforementioned files should be present.
 - i. Sometimes, in the process of compressing, extracting, and recompressing files, additional files or folders accidentally get added to the .zip file for attempted upload. Remove the additional files and re-compress the file or go to the original saved shapefile location and re-attempt compressing the appropriate files.
3. There are Z coordinates present in the spatial data.
 - a. In order to be successfully uploaded, spatial data must only have X Y coordinate data. The AKN does not currently have the ability to accept files with Z coordinates.
 - b. To check if this is the case open the shapefile in ArcMap. Right click the data layer and select **Properties**.



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- i. Under the **Source** tab in the *Data Source* section, for **Coordinates have Z values**: it should say **no**.
 - ii. A solution to this issue is provided under the **Solutions** section below.
 4. The shapefile may not be projected correctly.
 - a. The file may be projected in a way that it is not referenced to the correct coordinate system.
 - b. To check this, either:
 - i. view the .prj file in a text viewing application, like notepad or WordPad, which should read:

```
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984"...
```
 - ii. or open the shapefile in ArcMap. Right click the layer and select properties. Under the **Source** tab in the *Data Source* section **GCS_WGS_1984** should be listed for Geographic Coordinate System and **D_WGS_1984** should be listed for Datum. There should be no information on the projection.
 - c. A solution to this issue is provided under the **Solutions** section below.

b. Solutions

1. To removing Z coordinates from a shapefile:
 - a. Under the **Geoprocessing** tab select *ArcToolbox*.
 - b. Expand the *Conversion Tools* tab, then the *To Geodatabase* tab. Select the **Feature Class to Geodatabase (multiple)** tool.
 - i. Select the shapefile you wish to edit from the drop down menu as the **Input Features**.
 - ii. Select the **Output Geodatabase** you wish to save your new shapefile to, and name it appropriately. Do not worry if you are unable to save it as a shapefile. Refer to **Saving your newly projected/transformed data** below.
 - iii. Click the **Environments** button at the bottom of the tool dialog box.
 - iv. Expand *Z Values*.
 - v. Under *Output has Z values* select **Disabled**.
 - vi. Click *OK* in the *Environments* dialog box and then *OK* in the geoprocessing tool.
2. The file can be re-projected with the correct coordinate system by first opening the shapefile in ArcMap.
 - a. Under the **Geoprocessing** tab select *ArcToolbox*
 - i. Expand the *Data Management Tools* tab, then the *Projections and Transformations* tab. Select the **Project** tool.
 - b. For *Input Dataset or Feature Class*, select the data you wish to re-project from the drop down menu.



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- c. For *Output Dataset or Feature Class* browse to the location where you want to save your newly projected file and name it appropriately. It is ok that if there is not an option to be saved as a shapefile at this time. Refer to **Saving your newly projected/transformed data** below.
- d. For *Output Coordinate System*, click the button to the right of the input box, which resembles a hand pointing to something on a sheet of paper.
 - i. Expand *Geographic Coordinate Systems*.
 - ii. Expand *World*.
 - iii. Select **WGS 1984** and click *OK*.
- e. Click *OK*.
 - ii. Your newly projected file should automatically appear under the layers tab.
- f. Overlay a base map to check if the projection is where you expect.

4.3 Saving your newly projected/transformed data

1. Right click the file under the layers tab.
 - a. Select **Data**, and then select **Export Data**.
2. Confirm that both *All features are being exported*, and *use the same coordinate as this layer's source data* are selected.
3. Use the browse button to select the folder you wish to save the shapefile.
 - a. Name the file so you may easily identify it.
 - b. Confirm that for *Save as file type*, **Shapefile** is selected.
 - c. Click *Save* and then click *OK* to export the data.

4.4 Prepare shapefile for upload into AKN

1. In your file explorer, go to where your shapefile was saved.
2. There should be many files here of many types of extensions, not just .shp.
 - a. Select all of the .shp/.shx/.dbf files and right click.
 - i. Under *Send to* select **Compressed (zipped) file** and then name it appropriately.
 - b. **TIP:** There should be a .prj file among the many files exported from ArcMap. If you open this file in a text reader, like notepad or WordPad, it will give you information on the geographic coordinate system.
3. The resulting .zip file is what you will need for the SHP spatial data upload in the AKN.



4.5 Add Long Name and Short Name fields to your shapefile's attribute table in ArcMap

1. Open your shapefile in ArcMap
2. Right click your shapefile and select **Open Attribute Table**.
3. Select the drop down arrow on the left most button under the *Table* section which resembles a sheet of paper and select **Add Field**.
4. Put the name of the field you want to create (i.e. Long_Name or Short_Name) in the name sections and select **Text** for *Type*.
 - a. If creating a field for Short Name make sure that a maximum of 12 characters are allowed for that field.
 - b. Click **OK**
5. Right click your shapefile, scroll to *Edit Features* and select **Start Editing**.
6. Right click your shapefile again and select **Open Attribute Table**.
 - a. There you should see your newly added fields which should be empty.
 - b. Double click in any box to edit the field, and add the appropriate long and short names for each point.
7. When you are done editing your fields, select **Editor**, part of the editor toolbar at the top of the map, and click **Save Edits**. Then under **Editor** again, click **Stop Editing**.